

WHAT IS CLAIMED IS:

1. A method of identifying a stem cell comprising:
  - (a) obtaining a cell sample which contains a stem cell; and
  - (b) detecting the expression of BCRP by a cell in the cell sample; wherein a cell that expresses BCRP is identified as a stem cell.
2. The method of Claim 1 wherein said detecting is performed with an antibody that binds to BCRP; and wherein a stem cell is identified if it binds to said antibody.
3. The method of Claim 1 wherein said detecting is performed with a PCR probe for the nucleic acid that expresses BCRP.
4. The method of Claim 1 wherein said detecting is performed by measuring the pumping activity of the cell; wherein a stem cell is identified if it can remove Hoechst 33342 dye, but not Rhodamine 123 dye.
5. The method of Claim 1 further comprising:
  - (c) detecting the expression of a cell marker associated with stem cells; wherein a cell that expresses BCRP and expresses the cell marker is identified as a stem cell.
6. The method of Claim 5 wherein said cell marker is selected from the group consisting of EM10, CD34, Thy-1, P-gp, Ac133, and c-kit.
7. The method of Claim 5 wherein said cell marker is CD34 and wherein the cell is also CD38<sup>+</sup>.
8. The method of Claim 1 further comprising:
  - (c) detecting the expression of a lineage specific marker; wherein a cell that expresses BCRP but does not express the lineage specific marker is identified as a stem cell.

9. The method of Claim 8 wherein said stem cell is a hematopoietic stem cell and the lineage specific marker is selected from the group consisting of CD2, CD3, CD4, CD8, CD14, CD15, CD16, CD19, CD20, CD33, CD38, CD56, CD71, HLA-DR, and glycophorin A.

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10. A method of isolating a cell that expresses BCRP comprising:
- (a) obtaining a cell sample which contains a cell that expresses BCRP;
  - (b) detecting the expression of BCRP by a cell in the cell sample; and
  - (c) isolating the cell that expresses BCRP.

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11. A method of isolating a cell that expresses BCRP comprising:
- (a) obtaining a cell sample which contains a cell that expresses BCRP;
  - (b) contacting the cell sample with an antibody that binds to BCRP; and
  - (c) isolating a cell from the cell sample that binds to said antibody;

15 wherein the isolated cell is a cell that expresses BCRP.

12. The method of Claim 11, wherein said isolating is performed by flow cytometry.

20 13. The method of Claim 12, wherein said antibody has a fluorescent label and said isolating is performed by fluorescence-activated cell sorting.

14. An isolated stem cell obtained by the method of Claim 11.

25 15. A cell population enriched for stem cells obtained by a method comprising:

- (a) obtaining a mixed population of cells which comprises both stem cells and cells that are not stem cells; and
- (b) separating the cells of the mixed population of cells into two individual groups of cells based on whether they do or do not express BCRP; wherein the group

30 of cells that express BCRP is a cell population enriched for stem cells.

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16. An antibody that recognizes an extracellular portion of a BCRP; wherein said extracellular portion of the BCRP is in its natural conformation.
17. The antibody of Claim 16 wherein the BCRP is on the surface of a viable stem  
5 cell.
18. A method for determining the amount of BCRP expressed in a human subject having or suspected of having leukemia comprising:
- 10 (a) obtaining a leukemic cell from the subject; and  
(b) determining the amount of BCRP expressed in the leukemic cell.
19. The method of Claim 18, wherein the leukemia is acute myelogenous leukemia (AML).
- 15 20. The method of claim 19 wherein the leukemic cell is a blast cell.

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